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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,092

05/03/2006

Tetsuo Nishida

TAM-062

4737

20374 7590 06/25/2008

KUBOVCIK & KUBOVCIK  
SUITE 1105  
1215 SOUTH CLARK STREET  
ARLINGTON, VA 22202

EXAMINER

WILLS, MONIQUE M

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,092	<b>Applicant(s)</b> NISHIDA ET AL.	
	<b>Examiner</b> Monique M. Wills	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/3/06</u> .  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Information Disclosure Statement***

The information disclosure statements filed May 3, 2006 has/have been received and complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. Accordingly, the information disclosure statement(s) is/are being considered by the examiner, and an initial copied is attached herewith.

***Foreign Priority Documents***

The Japanese foreign priority document(s) 2003-374785 , filed May 3, 2006 and submitted under 35 U.S.C. § 119 (a)-(d), has/have been received and placed of record in the file.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The "i.e." appears to the transition phrase, but makes it unclear as to whether the quaternary ammonium salt and lithium salt are present individually or together. The Examiner suggests the transition phrase: "comprising", "consisting essentially of" or "consisting of" to clarify the electrolyte composition.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato U.S. Pub. 2007/0031729.

With respect to **claim 1**, Maruo teaches an electrolytic solution for use in nonaqueous electrolytic lithium secondary cells which contains a room temperature molten salt comprising an aliphatic quaternary ammonium salt of the  $\text{NR}^1\text{R}^2\text{R}^3\text{R}^4\text{X}^1$ , an organic solvent and a lithium salt of  $\text{LiX}^2$  (par. 18) wherein  $\text{R}^1$  to  $\text{R}^3$  are each a chain hydrocarbon having 1 to 4 carbon atoms (par. 18),  $\text{R}^4$  is methoxymethyl, (par. 34), and  $\text{X}^1$  and  $\text{X}^2$  are each a fluorine-containing anion, such as  $\text{BF}_4$  (par. 18). With respect to **claim 2**, the fluorine-containing anions  $\text{X}^1$  and  $\text{X}^2$  are each a fluorine-containing anion, such as  $\text{BF}_4$  tetrafluoroborate (par. 18). With respect to **claim 6**, the electrolyte is employed in a nonaqueous electrolytic lithium secondary cell comprising a positive electrode, negative electrode, separator and a nonaqueous electrolytic solution.

Art Unit: 1795

See paragraph 158. With respect tot **claim 7**, the fluorine-containing anions  $X^1$  and  $X^2$  are each a fluorine-containing anion, such as  $BF_4$  tetrafluoroborate (par. 18). With respect to **claim 9**, the negative electrode is graphite (par. 158).

Sato does not expressly disclose: vinylene carbonate in an amount of 1 to 5wt% based on the electrolytic solution (**claim 1**); molten salt contained in an amount of 1 to 15wt % (**claims 3-5 & 8**).

However, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the vinylene carbonate in an amounts of 1 to 5wt%,, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). The skilled artisan recognizes that the amount of solvent directly effects organic-solvent decomposition (claim 1).

With respect to the organic solvent amounts of 1 to 15wt%, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to employ the instant weight percents, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 ( CCPA 1980). The skilled artisan recognizes that the amount of solvent directly effects ion transfer between electrodes (claims 3-5 & 8).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuyama et al. JP 2004-247176 in view of Nakagawa et al. U.S. Pub. 2006/0068296.

With respect to **claim 1**, Kikuyama teaches an electrolytic solution for use in nonaqueous electrolytic lithium secondary cells which contains a room temperature molten salt comprising an aliphatic quaternary ammonium salt of the  $NR^1R^2R^3R^4X^1$ , an organic solvent and a lithium salt of  $LiX^2$  (par. 8) wherein  $R^1$  to  $R^3$  are each a chain hydrocarbon having 1 to 4 carbon atoms (par. 9 & 11),  $R^4$  is methoxymethyl, (par. 18), and  $X^1$  and  $X^2$  are each a fluorine-containing anion, such as  $BF_4$  (par. 14).

With respect to **claim 2**, the fluorine-containing anions  $X^1$  and  $X^2$  are each a fluorine-containing anion, such as  $BF_4$  tetrafluoroborate (par. 14). With respect to **claim 6**, the electrolyte is employed in a nonaqueous electrolytic lithium secondary cell comprising a positive electrode, negative electrode, separator and a nonaqueous electrolytic solution. See paragraphs 1 and 2. With respect to **claim 7**, the fluorine-containing anions  $X^1$  and  $X^2$  are each a fluorine-containing anion, such as  $BF_4$  tetrafluoroborate

Art Unit: 1795

(par. 14). The electrolyte organic solvent includes ethylene carbonate, propylene carbonate or butylene carbonate (par. 20).

Kikuyama does not expressly disclose: vinylene carbonate in an amount of 1 to 5wt% based on the electrolytic solution (**claim 1**); molten salt contained in a amount of 1 to 15wt % (**claims 3-5 & 8**); or carbon negative electrode (**claim 9**).

Nakagawa teaches the addition of vinylene carbonate in lithium cells employing quaternary ammonium salts, in order to inhibit organic-solvent decomposition (par. 4). The negative electrode is graphite (par. 88).

Kikuyama and Nakagawa are analogous art form the same field of endeavor, namely, fabricating secondary cells with quaternary ammonium salts.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the vinylene carbonate of Nakagawa, in the battery of Kikuyama in order to inhibit organic-solvent decomposition (claim 1).

With respect to the organic solvent amounts of 1 to 15wt%, it would have been obvious to one having ordinary skill in the art at the time the instant invention was made to employ the instant weight percents, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 ( CCPA 1980). The skilled artisan recognizes that the amount of solvent directly effects ion transfer between electrodes (claims 3-5 & 8).

With respect to the employment of a carbonaceous negative electrode, it would have been obvious to employ said material, as the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) (claim 9).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Patrick Ryan, may be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.



Art Unit: 1795

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Monique M Wills/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795